Safety Instructions

Used symbols

Always observe this information to prevent damage to the device

Important Comments

Before starting with installation of the BNWAS, we recommend you to read the important information beneath.

Qualification

The installation of the product detailed in this manual, can only be installed by a certified installation company. Otherwise the warranty becomes void.

Caution:

Before starting with installing the BNWAS check if all parts are present.

Package includes:

- MS 421B, MS 422, MS 410 or MS 411
- Installation/User Manual BNWAS (only in BNWAS)
- Mounting Clips (2x)

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1. MS 421B WATCH ALARM

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1.1 Installation Manual

1.1.2Mechanical Installation

The MS 421B BNWAS units are specially designed for mounting in a switchboard or desk. The units can be mounted in the panel or desk with two mounting clips which are included. Beneath you will find the dimensions needed to mount the different units of the MS 421B BNWAS.

1.1.2.1 Dimensions MS 421B main unit

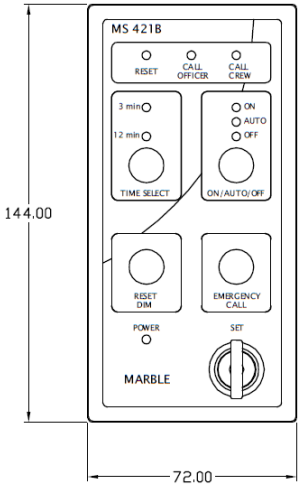

Figure 1. Front view MS 421B

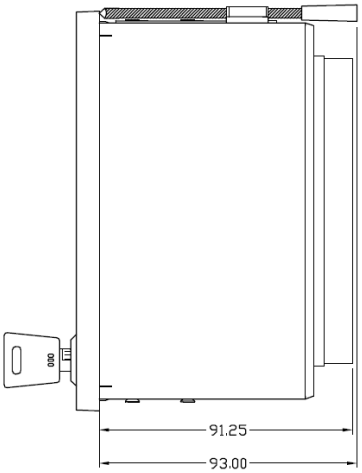

Figure 2. Side view MS 421B

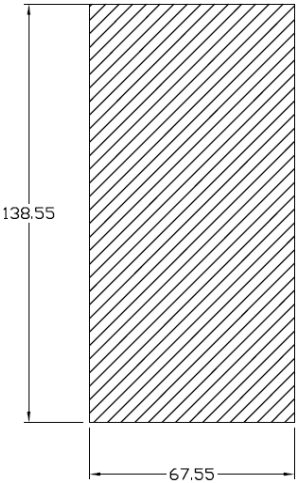

Figure 3. Panel cut out MS 421B

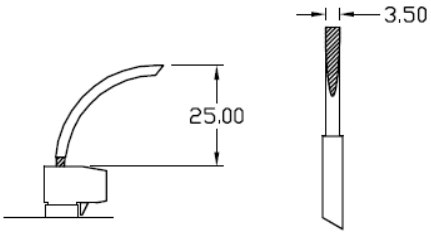

Figure 4. Wiring space MS 421B

1.1.3 Electrical installation

Description	Specification
Power supply	18-28 V DC
Max. current	180mA
Relay contacts	4
Transistor outputs	2
Relay switching current	30 Volt DC – 10A
	250 Volt AC – 10A
	30 Volt DC – 300 Watt
	250 Volt AC – 2500 Watt
Transistor current	24 Volt DC – 50mA
	24 Volt DC – 12 Watt

Table 1. Electrical specifications MS 421B

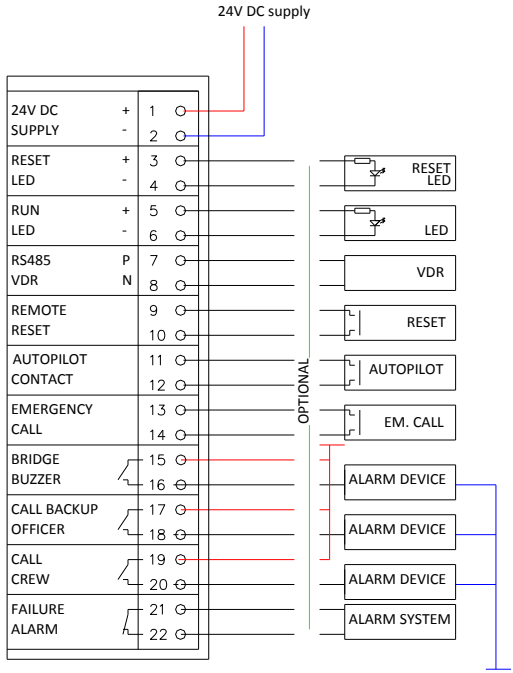

Figure 5. Wiring diagram MS 421B

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1.1.3.1 Data communication

The MS 421B is equipped with a RS-485 interface. With this interface it is possible to read all available information of the MS 421B. The protocol that is used is NMEA, this protocol is supported by almost every Voyage Data Recorder (VDR).

Messages are send when the MS 421B is 'on event' and every 10 seconds. The communication parameters and the data message are explained in the following tables.

Description	Specification
Protocol	NMEA-0183 (IEC 61162-1)
Communication Interface	RS-485
Baudrate	4800
Databits	8
Parity	None
Stopbits	1
Signal	On event and every 10 seconds.

Table 2: Data communication specifications MS 421B

NMEA message:*$BNALR,,000,A,A,C1=MAN;03;C3=0<CR><LF>*

Description	Specification
000	Alarm address (always 000)
A/V	A: Dormation time exceeded V: Dormation time not exceeded
A/V	A: Dormation time acknowledge V: Dormation time not acknowledge
C1	MAN: manual AUT: autopilot managed OFF: BNWAS switched off
C2	03: Dormation time 03 minutes selected 12: Dormation time 12 minutes selected
C3	0: Dormation time not exceeded 1: Dormation time exceeded 1st stage 2: 2nd stage (call officer) 3: 3rd stage (call crew)

1.1.4 Configuring the MS 421B

Configuration of the MS 421B can easily be done through the pushbuttons at the front panel.

Configuration roadmap		
Step 1		
Make sure the key is in vertical position, otherwise the MS 421B cannot be configured.		
Step 2		
Adjusting running time. The running time of the MS 421B can be configured with the button 'Time Select'. It is possible to choose a running time of 3 or 12 minutes.		
Step 3		
Function configuration. It is possible to choose three different functions.		
On	:	MS 421B is activated manually
Auto	:	MS 421B is linked at autopilot, activates when autopilot is turned on.
Off	:	MS 421B can be deactivated manually

Table 4. Configuration roadmap MS 421B

1.1.4.1 Time configuring to alert the all crew 'Call Crew'

This stage can be configured with the 16-position switch (0-F) at the PCB behind the removable front panel. The time is configurable from 90 – 180 seconds, each step is 6 seconds. The default setting is 90 seconds (0)

Using a small screw driver, the 16-position switch can be configured. The arrow at the switch displays the settings who are made.

Position	Seconds	Position	Seconds
0	90	8	138
1	96	9	144
2	102	A	150
3	108	B	156
4	114	C	162
5	120	D	168
6	126	E	174
7	132	F	180

Table 5. Configuring times MS 421B

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1.2 User manual

1.2.1 Introduction

The Marble Automation MS 421B is the main unit of the Bridge Navigational Watch Alarm System, later in the manual called BNWAS. The system is intended as security system for the officer in charge on the bridge and can be applied on all seagoing vessels. The main unit can be activated automatically or manual and has adjustable running times of 3 and 12 minutes.

The MS 421B main unit is equipped with an serial communication interface providing status data to the Voyage Data Recorder (VDR).
The MS 421B front LED's and backlight are dimmable.

The MS 421B is type approved according to the current legislation for Bridge Nautical Watch Alarm Systems, as laid down by the IMO in resolution 128(75).

IMO Res. A.694(17), IMO Res. MSC.128(75), IMO MSC/Circ.982, IMO Res. MSC.191(79), IMO Res. MSC.282(86), IEC 61162 Series, IEC 62288 Ed.1.0 (2008), IEC 60945 (2002), IEC 62616 (2010).

1.2.2 Operation

1.2.2.1 Restarting the timer of the MS 421B

After activation of the MS 421B a timer is started of 3 or 12 minutes, depending on the selected choice.

After passing the selected time, the LED 'Reset' will flash and the internal buzzer will give a short pre-alarm of halve second. After 15 seconds, the internal buzzer will pulsate continuously. At the same, time the relay contact of the bridge siren will be activated.

The officer in charge has 15 seconds to restart the running time of the MS 421B with the button 'Reset Dim'. When the MS 421B is not restarted by the officer in charge, the back-up officer will be alerted. The LED 'Call Officer' will flash. If the back-up officer not

responds in the preset time of 90-180 seconds, the entire crew will be alerted by activating the general alarm. The LED 'Call Crew' will flash.
When the emergency call function or call officer stage is active the MS 421B can only be reset by the reset button at the front panel.

Dim function: Push and hold the 'reset' button more than four seconds to dim the front panel LED's and the backlight.

1.2.2.2 Deactivating internal buzzer

The internal buzzer of the MS 421B can be deactivated by removing the jumper which is placed at the PCB. By removing the jumper, the contact will be interrupted if an alarm is coming in.

Figure 1. Jumper

1.2.2.1 Function of the "Emergency Call" button

Using the "Emergency Call" button, the MS 421B will switch to "Call Officer" stage, without activating a pre-alarm of the internal buzzer. If the back-up officer not responds in the preset time of 90-180 seconds, the entire crew will be alerted by activating the general alarm. The LED 'Call Crew' will flash.

1.2.3 Maintenance

The MS 421B unit is maintenance free. It is permitted to clean the front of the MS 421B unit with a damp cloth.

⚠ ***Do not use aggressive cleaning agents!***

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1.2.4 Troubleshooting

Symptom	Possible cause	Test and remedies
Buzzer gives no signal, when alarm MS 421B is active.	Jumper of the PCB is removed	Check presence of jumper on the PCB
Buzzer gives no signal, when alarm MS 421B is active.	Buzzer is defect	Contact Marble Automation
All LED's are burning, when there is no alarm	All 0 V DC are connected to each other	Reconnect the 0 V DC
LED's are not working	Short-circuit LED outputs, IC's are blown.	Contact Marble Automation
Odd characters on VDR	Communication wires are wrongly connected	Check connection of the wires and reconnect when it is desired
It is not possible to configure the MS 421B	Key-contact is broken	Contact Marble Automation

Table 6.Troubleshooting MS 421B

2. MS 422 SELECTION SWITCH

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2.1 Installation manual

2.1.1 Dimensions MS 422 selection switch

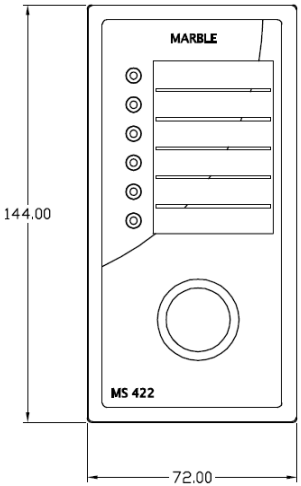


Figure 1. Front view MS 422

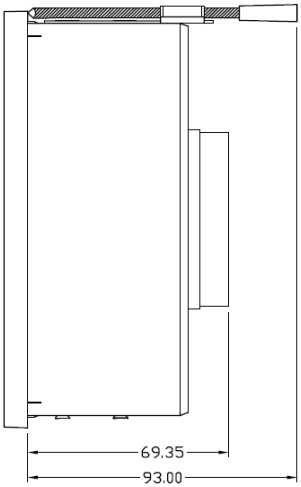


Figure 2. Side view MS 422

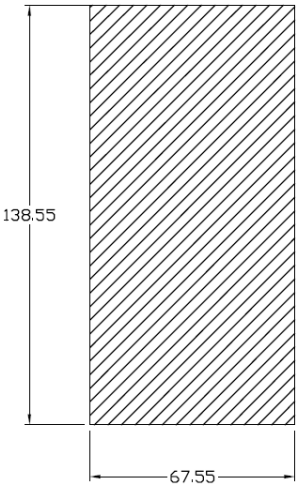


Figure 3. Panel cut out MS 422

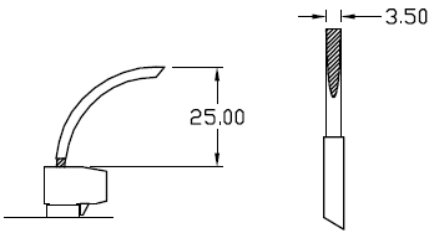
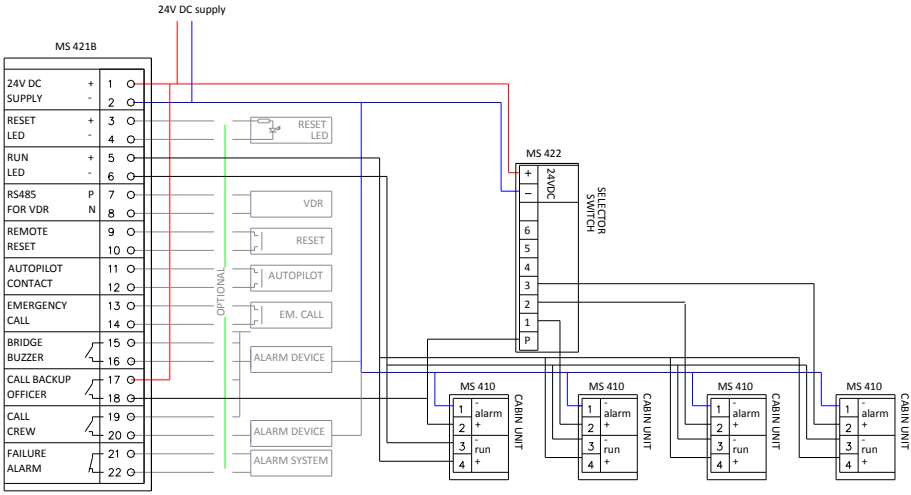


Figure 4. Wiring space MS 422

2.1.2 Electrical installation

Description	Specification
Power supply	18-28 V DC
Current LED's	10mA by 24 V DC
Max. switch positions	6

Table 1. Electrical specifications MS 422



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2.1.3 Configuring the MS 422

It is also possible to configure less than six officers when this is desired. For this option, the following steps have to performed.

Configuration roadmap
Step 1
Select the first position of the rotary switch
Step 2
Remove the black cap on top of the rotary using a small screw driver.
Step 3
Unscrew the nut, that the rotary switch comes off
Step 4
Unscrew the nut that is mounted on the front panel
Step 5
Remove the front panel and the mounting ring
Step 6
Remove the selection ring (default setting position 6) and place in desired position
Step 7
Repeat the steps in reverse order. Now configuration is done

Table 2. Configuration roadmap

For detailed instruction (with photo's) please visit our website www.marbleautomation.com (See product info MS 422 after login).

2.3.1.1 Note

An AutoCad template of the insert text of the MS 422 is available at our website: www.marbleautomation.com (first register and login on the website).

2.2 User manual

2.2.1 Introduction

When the MS 421B is used on a larger vessel and more officers are in charge, we recommend you to use the MS 422. The MS 422 is an optional unit for the MS 421B BNWAS. This unit is used to select which back-up officer is to be alarmed during emergency situations. The six yellow LED's indicate which back-up officer is ordered to the bridge when the MS 421B reaches the 'Call Officer' stage.

2.2.2 Maintenance

The MS 422 unit is maintenance free. It is permitted to clean the front of the MS 422 unit with a damp cloth.

Do not use aggressive cleaning agents!

2.2.3 Troubleshooting

Symptom	Possible cause	Test and remedies
Selection switch starts again at position 1	Selection ring is placed wrong	Check selection ring (See step 2.1.3)
Unit is not working	Polarity wrong connected	Check polarity

Table 3. Troubleshooting

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3. MS 410 BUZZER EXTENSION

3.1 Installation manual

3.1.1 Dimensions MS 410

The mounting dimensions for the unit MS 410 and MS 411 of the MS 421B BNWAS are the same.

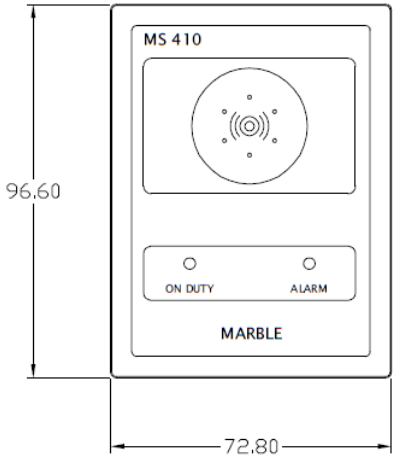

Figure 1. Front view MS 410

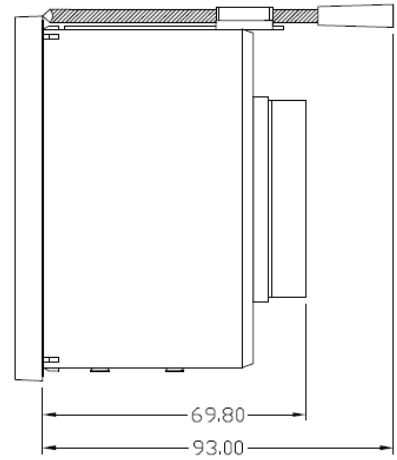

Figure 2. Side view MS 410

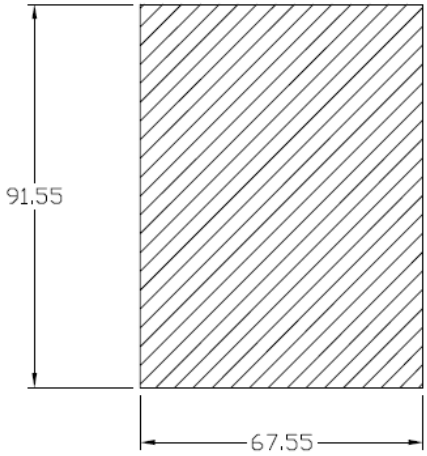

Figure3. Panel cut out MS 410

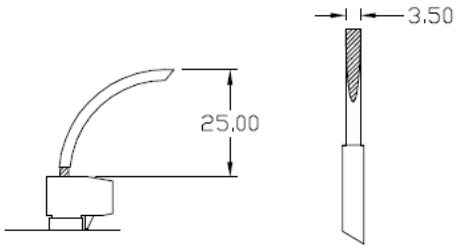

Figure 4. Wiring space MS 410

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3.1.2 Electrical installation

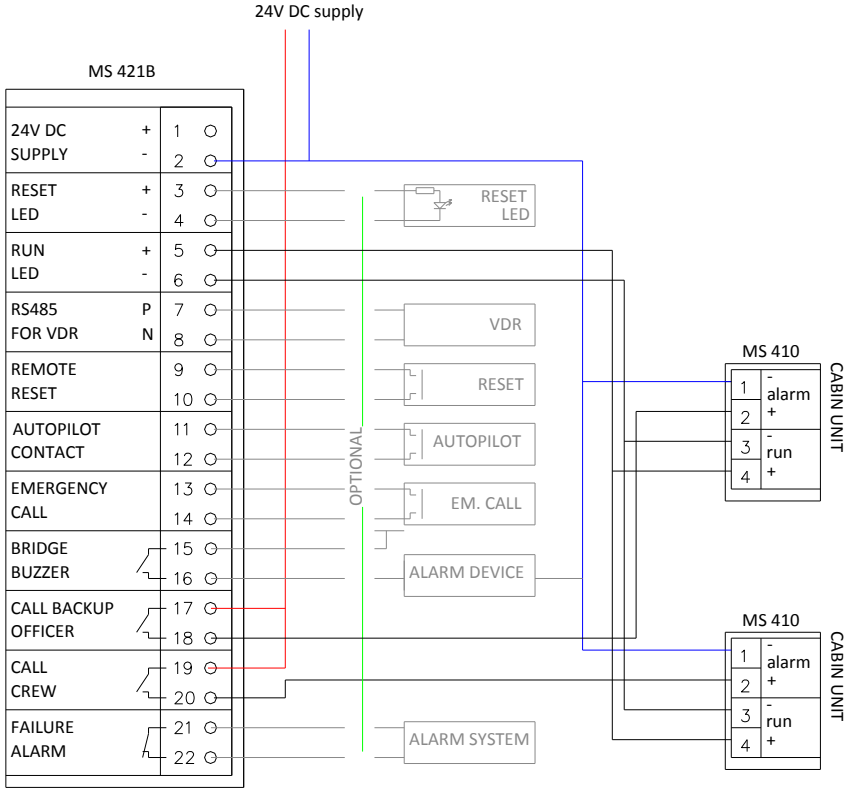

Table 5. Wiring diagram MS 410

(Or ask for complete terminal with drawings (on request).

Description	Specification
Power supply	18-28 V DC
Current run LED's	10mA by 24 V DC
Current Alarm LED and buzzer	30 mA by 24 V DC

Table 1. Electrical specifications

3.2 User manual

3.2.1 Operation

The MS 410 unit is an extension of the MS 421B BNWAS. The MS 410 is intended as a substation for in the officers cabin or galley. The front panel has a green (left) and a red (right) LED. The green Led indicates that the timer (3/12 minutes) is running. The Red LED indicates - together with the internal buzzer - that the MS 421B reached the stage 'Call Officer'.

3.2.3 Maintenance

The MS 410 unit is maintenance free. It is permitted to clean the front of the MS 410 unit with a damp cloth.

Do not use aggressive cleaning agents!

3.2.4 Troubleshooting

Symptom	Possible cause	Test and remedies
Red LED is burning, but internal buzzer is giving no signal	Buzzer is broken	Contact Marble Automation
LED's are not working	Polarity wrong connected	Check polarity

Table 2. Troubleshooting

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4. MS 411 RESET UNIT

4.1 Installation manual

4.1.1 Dimensions MS 411

The mounting dimensions for the unit MS 410 and 411 of the MS 421B BNWAS are the same.

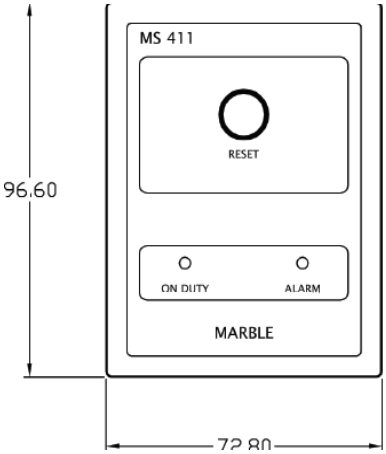

Figure 1. Front view MS 411

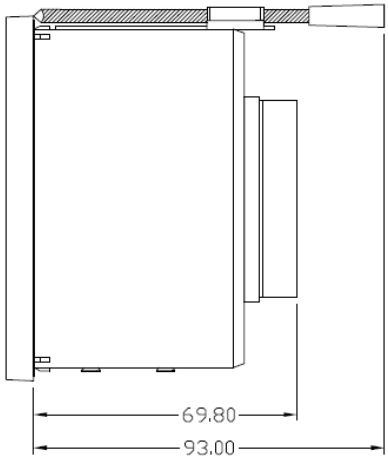

Figure 2. Side view MS 411

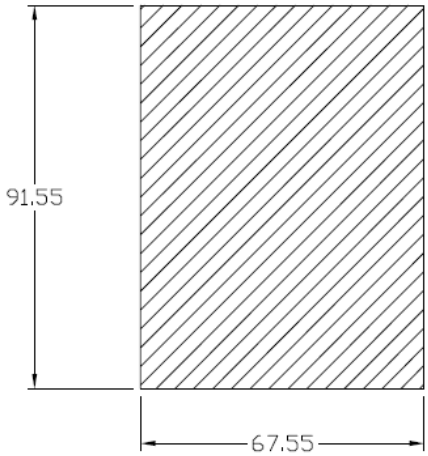

Figure 3. Panel cut out MS 411

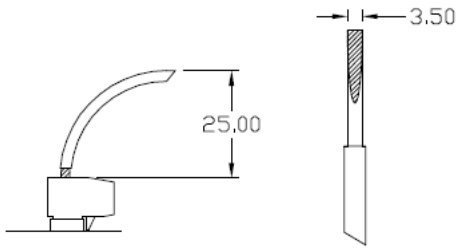

Figure 4. Wiring space MS 411

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4.1.2 Electrical installation

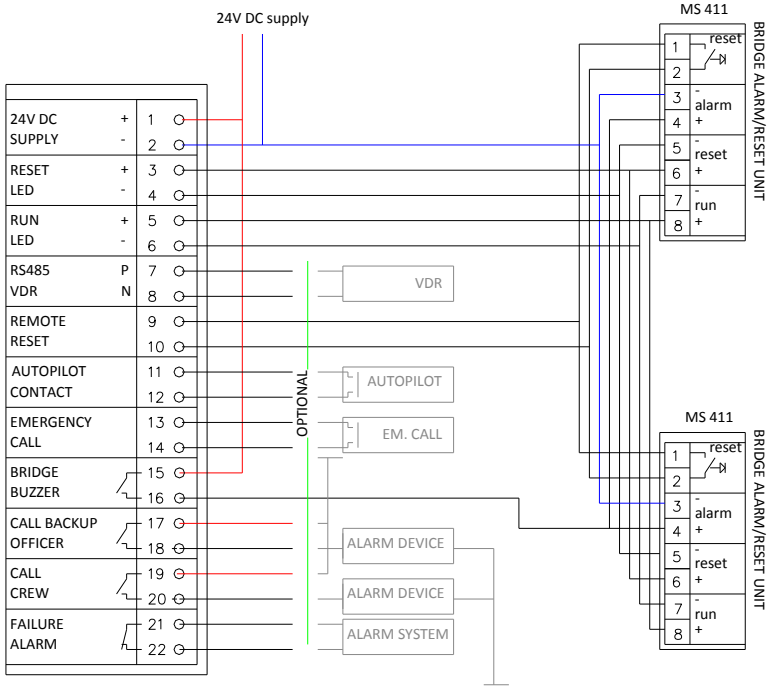

Figure 5. MS 411 Wiring diagram

Description	Specification
Power supply	18-28 V DC
Current run LED's	10mA by 24 V DC
Current Alarm LED and buzzer	30 mA by 24 V DC

Table1. Electrical specifications

4.2 User manual

4.2.1 Operation

The MS 411 reset unit is an remote reset extension for the MS 421B BNWAS. This unit is only allowed to be placed on the bridge (by regulations). The green LED indicates that the timer (3/12 minutes) is running. The red LED is flashing simultaneously with the reset LED of the MS 421B main unit, announcing that the timer will exceed soon. The internal buzzer sounds simultaneously with the internal buzzer of the MS 421B main unit. It indicates the back-up officer will be ordered to the bridge within 15 seconds.

When the reset button is pushed, the timer (3/12 minutes) of the MS 421B will restart. It will also reset an 'Officer/Call Crew' alarm stage.

4.2.2 Maintenance

The MS 411 unit is maintenance free. It is permitted to clean the front of the MS 411 unit with a damp cloth.

Do not use aggressive cleaning agents!

4.2.3 Troubleshooting

Symptom	Possible cause	Test and remedies
Remote reset gives no signal, when alarm MS 421B is active.	Buzzer is broken	Contact Marble Automation
Both LED's are burning, when there is no alarm	Both 0 V DC are connected to each other	Reconnect the 0 V DC
Reset button is not working	PIR connected with an N.C. (Normally Closed) contact	Connect a PIR with a N.O. (Normally Open) contact
LED's are not working	Polarity wrong connected	Check polarity

Table 2. Table troubleshooting

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5. Attachments

Marble Automation delivers also the following sub products for the BNWAS.

5.1 MS 415 Outdoor wing reset unit

The MS415 is a remote reset unit for resetting the BNWAS on different places on the Bridge. This device may only be placed on the bridge. Especially for outside a watertight version is made. The buzzer indicate that the 3/12 minute watch alarm timer has exceeded. By pressing the reset button on the MS415 unit the watch alarm timer will reset and recover bridge alarm/call officer/call crew stages. The pushbutton will also be illuminated when the alarm is activated.

Figure 1. MS 412 Outdoor wing reset unit

3.2 MS 450 Bezel for MS 410 / 411

A bezel for the DIN housing with dimension 72x96 (WxH)

Figure 2. Bezel for MS 410/411

3.3 MS 451 Bezel for MS 421 / 422

A bezel for the DIN housing with dimension 72x144 (WxH)

Figure 3. Bezel for MS 421/422

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3.4 MS 455 Wall mount box for MS 410 / 411

3.5 MS 456 Wall mount box for MS 421 B / 422

3.6 MS Horn

Figure 4. MS Horn

For drawings see our website www.marbleautomation.com (after login).

3.7 MS Horn beacon

Figure 5. MS Horn beacon

For drawings see our website www.marbleautomation.com (after login).

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Description	Specification
Power supply	17 – 60 V DC
Current sounder	4 – 45 mA
Current beacon	5 mA
Peak sound level	94 – 106 dBA at 1m*
Number of tones	32
Frequency range	400 – 2850 Hz*
Operating temperature	-25°C to +70 °C
Casing	High impact polycarbonate
IP rating	IP21
	IP65 (with deep base)
Synchronisation	Automatic

Table 2. MS Horn beacon specifications

3.8 MS PIR

Figure 6. MS Pir

Description	Specification
Infrared sensor	Omni-derectional dual
Power supply	24 ±2 V AC/DC
Detection range	Height x 2.5 at 25°C
Output format	Form C, 30 VDC, 0.sA max.
Current drain	5 mA @24 VAC
Mounting height	2.4 – 4.2 m
Detectable speed	0.1 – 3.0 m/sec.
RFI immunity	Av. 20 V/m (10 – 1,000 MHz)
Temperature	-20°C – 50 °C (-4°F – 122 °F)
Humidity	95% RH max.
Dimensions	110 (Dia.) x 44 (H) mm

Table 3. MS Pir specifications

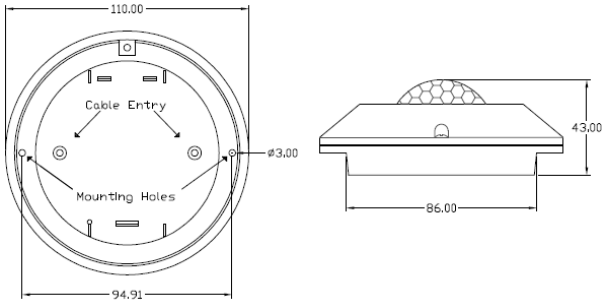

Figure 7. MS Pir dimensions

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